

Changes of macrominerals and calcitropic hormones in serum of periparturient dairy cows subject to subclinical hypocalcemia

Chuanjiang Cai¹, Kai Liu¹, Jianguo Wang^{1,2}

¹College of Animal Science and Technology, Northwest A&F University, Yangling 712100, Shaanxi, China

²College of Veterinary Medicine, Northwest A&F University, Yangling 712100, Shaanxi, China

Correspondence: Jianguo Wang, College of Veterinary Medicine, Northwest A&F University, No.22 Xinong Road, Yangling, Shaanxi Province, 712100, China.

Telephone: +86 13679288815 Fax number: +86(0)29 8709 2429

E-mail: jgwang0625@nwsuaf.edu.cn

College of Veterinary Medicine and College of Animal Science and Technology contributed equally to this study.

Running head: Macromineral elements and calcitropic hormones in cows

Summary

The aims of the study reported in the Research Communication were to evaluate changes of macrominerals and major calcitropic hormone concentrations in 51 healthy dairy cows over the peripartum period and to investigate the relationship between Ca and other serum metabolites from 51 subclinically hypocalcemic and 51 normocalcemic periparturient dairy cows on calving day. The results showed that serum Ca and potassium (K) concentrations were lowest in the healthy periparturient dairy cows at parturition, while sodium (Na) and parathyroid hormone (PTH) concentrations were highest. Serum magnesium (Mg), chloride (Cl) and phosphorus (P) concentrations were highest 1 wk prepartum, however, the concentration of 1,25-dihydroxyvitamin D₃ [1,25(OH)₂D₃] was highest 1 wk postpartum. The dairy cows with SCH had significantly lower serum levels of Ca, K, Na, Mg, Cl, 1,25(OH)₂D₃ and glucose and had significantly higher levels of serum P, non-esterified fatty acids (NEFA) and β-hydroxybutyrate (BHBA) than the healthy cows on calving day. These data demonstrated that the concentrations of macrominerals and major calcium regulating hormones of cows change dramatically over the peripartum period. Furthermore, SCH was associated with ketosis and fatty liver.